

CLAIMS

What is claimed is:

1. A laminate for use as a battery housing, comprising:
2. (a) a sealant layer that is capable of acting as a barrier to an
3. electrolyte, the sealant layer having an internal surface that is substantially inert to the
4. electrolyte and an external surface;
5. (b) a barrier layer comprising a first layer of metal foil and a second
6. layer of metal foil adjacent to the first layer, the barrier layer having a first surface
7. disposed adjacent to the external surface of the sealant layer and an external surface.
1. 2. The laminate of claim 1, further comprising a layer of adhesive
2. material between at least one pair of layers selected from the first and the second layers
3. of metal foil and the sealant layer and the first layer of metal foil.
1. 3. The laminate of claim 1 wherein the first and second layers of
2. metal foil comprise aluminum foil.
1. 4. The laminate of claim 1 wherein the first layer and the second
2. layer of metal foil each have a thickness of between 6 micrometers and 120
3. micrometers.
1. 5. The laminate of claim 1 wherein the sealant layer is a polymer.
1. 6. The laminate of claim 5 wherein the sealant layer is selected from
2. the group consisting of polyesters, polyamides, polyvinylchlorides, fluoroplastics, and
3. polyolefins.
1. 7. The laminate of claim 5 wherein the polymer is selected from the

2 group consisting of low density polyethylene, high density polyethylene, medium
3 density polyethylene, linear low density polyethylene (LLDPE), two-ply high density
4 polyethylene/linear low density polyethylene, ethylene interpolymers, polyethylene
5 terephthalate, polypropylene, polychloro-trifluoroethylene, polyphenylene sulfide,
6 ethylene vinyl acetate, ethylene vinyl alcohol, nitrile resin films, nylon, rubber, and
7 combinations thereof.

1 8. The laminate of claim 1, further comprising a protective layer
2 having a surface disposed adjacent to the external surface of the moisture barrier layer.

1 9. The laminate of claim 8 wherein the protective layer is a
2 polymer.

1 10. The laminate of claim 9 wherein the protective layer is selected
2 from the group consisting of polyesters, polyamides, polyvinylchlorides, fluoroplastics,
3 polyacrylonitrile, and polyolefins.

1 11. The laminate of claim 9 wherein the polymer is selected from the
2 group consisting of low density polyethylene, high density polyethylene, medium
3 density polyethylene, linear low density polyethylene (LLDPE), two-ply high density
4 polyethylene/linear low density polyethylene, ethylene interpolymers, polyethylene
5 terephthalate, polypropylene, polyacrylonitrile, polychloro-trifluoroethylene,
6 polyphenylene sulfide, ethylene vinyl acetate, ethylene vinyl alcohol, nitrile resin films,
7 nylon, rubber, and combinations thereof.

1 12. The laminate of claim 1 wherein sealant layer contains an
2 absorbent material.

1 13. The laminate of claim 12 wherein the absorbent material is
2 selected from the group consisting of molecular sieves, magnesium phosphate, calcium
3 sulfate, silica gel, clays, activated charcoal, activated alumina, water absorbent resins,

4 titanium oxide, zirconium oxide, calcium oxide, and combinations thereof.

1 14. The laminate of claim 2 wherein the adhesive contains an
2 absorbent material.

1 15. The laminate of claim 14 wherein the absorbent material is
2 selected from the group consisting of molecular sieves, magnesium phosphate, calcium
3 sulfate, silica gel, clays, activated charcoal, activated alumina, water absorbent resins,
4 titanium oxide, zirconium oxide, calcium oxide, and combinations thereof.

1 16. The laminate of claim 8 wherein the protective layer contains an
2 absorbent material.

1 17. The laminate of claim 16 wherein the absorbent material is
2 selected from the group consisting of molecular sieves, magnesium phosphate, calcium
3 sulfate, silica gel, clays, activated charcoal, activated alumina, water absorbent resins,
4 titanium oxide, zirconium oxide, calcium oxide, and combinations thereof.

1 18. The laminate of claim 1, further comprising an absorbent material
2 coated onto the internal surface of the sealant layer.

1 19. The laminate of claim 18 wherein the absorbent material is
2 selected from the group consisting of molecular sieves, magnesium phosphate, calcium
3 sulfate, silica gel, clays, activated charcoal, activated alumina, water absorbent resins,
4 titanium oxide, zirconium oxide, calcium oxide, and combinations thereof.

1 20. A laminate for use as a battery housing, comprising:
2 (a) a sealant layer that is capable of acting as a barrier to an
3 electrolyte, the sealant layer having an internal surface that is substantially inert to the
4 electrolyte and an external surface;
5 (b) an absorbent material pattern printed on the internal surface of

6 the sealant layer.

1 21. The laminate of claim 20 wherein the absorbent material is a
2 moisture absorbent selected from the group consisting of molecular sieves, magnesium
3 phosphate, calcium sulfate, silica gel, activated charcoal, water absorbent resins, and
4 combinations thereof.

1 22. The laminate of claim 20 wherein the absorbent material is a
2 hydrofluoric acid absorbent selected from the group consisting of activated alumina,
3 activated charcoal, molecular sieves, clays, titanium oxide, zirconium oxide, calcium
4 oxide, and combinations thereof.

1 23. The laminate of claim 20 wherein the sealant layer contains an
2 absorbent material.

1 24. The laminate of claim 20 further comprising a barrier layer
2 characterized by an internal surface that is disposed adjacent to the external surface of
3 the sealant layer and an external surface.

1 25. The laminate of claim 24 wherein the barrier layer contains an
2 absorbent material.

1 26. The laminate of claim 24, further comprising an adhesive
2 material between the sealant layer and the barrier layer.

1 27. The laminate of claim 26 wherein the adhesive material contains
2 an absorbent material.

1 28. The laminate of claim 24, further comprising a protective layer
2 characterized by an internal surface that is disposed adjacent to the external surface of
3 the barrier layer and an external surface.

1 29. The laminate of claim 28 wherein the protective layer contains an
2 adhesive material.

1 30. The laminate of claim 28, further comprising an adhesive
2 material between the protective layer and the barrier layer.

1 31. The laminate of claim 30 wherein the adhesive material contains
2 an absorbent material.

1 32. A housing for a battery, comprising:
2 (a) a laminate comprising a sealant layer that is capable of acting as a
3 barrier to an electrolyte, the sealant layer having an internal surface that is substantially
4 inert to the electrolyte and an external surface, wherein the laminate is fashioned into a
5 pouch having at least one seam that is double sealed by a first and a second sealing
6 region such that a channel is defined between the first and the second sealing regions;
7 and
8 (b) an absorbent material located within the channel defined by the
9 first and second sealing regions of the double seal.

1 33. The laminate of claim 32 wherein the absorbent material is a
2 moisture absorbent selected from the group consisting of molecular sieves, magnesium
3 phosphate, calcium sulfate, silica gel, activated charcoal, water absorbent resins, and
4 combinations thereof.

1 34. The laminate of claim 32 wherein the absorbent material is a
2 hydrofluoric acid absorbent selected from the group consisting of activated alumina,
3 activated charcoal, molecular sieves, clays, titanium oxide, zirconium oxide, calcium
4 oxide, and combinations thereof.